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ABSTRACT

A study was conducted in an effort to better understand what assumptions and strategies students bring with them to the task of dictionary use as well as what knowledge they take away from it. Data were collected in three middle-class school systems in the suburbs of a large, Midwestern city. Participants were 55 fourth-grade students ranking stanine 4 or above on the district assessment tests. The basic task in which the students were observed was the completion of a dictionary assignment common to fourth-grade reading instruction, using the dictionary to locate an entry for a targeted word which was presented in sentence context. Though the primary concern was the analysis of student comments and questions and teacher observations, a performance score was determined to analyze the comparability of the group performance. Results indicated two insights for instruction and several directions for further classroom research. The first insight was the recognition that dictionaries could be much more "user-friendly" for middle-school students. Students had some basic suggestions for dictionary designers that were interesting and relevant to the task. The second insight, the most dramatic one for the teachers, concerned the relative ineffectiveness of the dictionary task. For most of the teachers, this led to a resolution to reconsider the use of the task and to experiment with different types of instruction. (Five tables of data are included, and one appendix from the Scott Foresman Intermediate Dictionary is attached.) (MG)

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Observing Dictionary Users:

Teachers Look at Fourth Grade Students

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Observing Dictionary Users:

Teachers Look at Fourth Grade Students

Introduction

In an examination of dictionary instruction (Fisher, Kent & Blachowicz, 1990) one of the most characteristic instructional tasks was found to be the use of the dictionary to determine the meaning of a word presented in a limited context. Typically students are given words in sentences, asked to find an appropriate dictionary definition for the word and are sometimes asked to produce a sentence that demonstrates their comprehension of the word's meaning. This same task is also commonly used by researchers to gather information about dictionary use (Miller & Gildea,1987; McKeown, 1989; Scott & Nagy,1989). These studies focus on the miscues students produce in constructing and evaluating definitions and exemplar sentences as data from which to infer student strategies. This research suggests that students mobilize such strategies as looking for word matches in the examples, focusing on particular words and fragments in the definition, and over and undergeneralizing when asked to used the dictionary for meaning.

The research to be reported here was conceived and carried out by a group of teachers who were themselves capable dictionary users and shared the belief that the ability to use this reference was one mark of a literate language user (Iris, Litowitz & Evens, 1988). Yet they were intrigued by the contrast between the pervasiveness of dictionary meaning tasks in the curriculum and the lack of research support for the efficacy of such a task.

These teacher-researchers wanted a better picture of what assumptions and strategies students brought to the task as well as what knowledge they took away from it. To these ends, the teachers met over a period of six months to plan how to investigate this issue, collect data in their classrooms and districts, analyze the data collaboratively and summarize their conclusions, questions and insights for instruction.

Method

It was decided that the methodology to be used would be primarily a qualitative one with some quantitative data collected on performance. The methodology for data collection, consolidation and analysis was shaped by models presented by Goetz and LeCompte (1984).

Site : Data were collected in three middle class school systems in the suburbs of a large, Midwestern city. District norms on the state reading measure (Illinois Goals Assessment Program, 1989) and on the standardized tests used in each district are above state and national norms.

Participants: Participants were 55 fourth grade students ranking stanine 4 or above on the district assessment tests (California Achievement Test, 1985; Metropolitan Achievement Tests, 1978). 4th grade was chosen as that grade is commonly a targeted grade for dictionary instruction in basal series yet is not the year in which such instruction is first introduced. Average or above average readers were chosen so that reading difficulty would not be a factor and so as to provide a "best picture" of student strategies.

Observers/Interviewers: Observers/interviewers were eight experienced teachers with advanced degrees in literacy education.

Materials: The basic task in which the students were observed was the completion of a dictionary assignment common to 4th grade reading instruction, using the dictionary to locate an entry for a targeted word which is presented in sentence context. The words chosen were all concrete nouns with more than three definitions listed in the Scott Foresman Intermediate Dictionary (Scott Foresman & Co., 1983; see Appendix A). The words were chosen at three levels of familiarity as estimated by The Living Word Vocabulary (Dale and O'Rourke, 1981):

Level 1--very familiar (70% or more familiarity at 4th grade) in the form used in the task sentence (e.g queen, house)

Level 2--less familiar words (68% or more 6th grade familiarity) (e.g. vessel; trough)

Level 3--Word with low familiarity (70% only at 10th grade or above) (e.g. torrent, scaffold)

The order of the targeted definitions was not predictable (See Table 1).

These words were used to construct a basic dictionary task which formed the basis for all observations. The task followed a format common to many basal programs where students were to look at the word in a context sentence, find the appropriate definition and generate an original sentence which displayed their knowledge of the word. For example, for the word scaffold the task was:

6. The painters set up their scaffold before beginning to work.

The number of the best dictionary definition is_____

The meaning is (from the dictionary or in your own words)
_____

_____

_____

Write your own sentence here:
_____

_____

_____

An "amplified task' was also constructed that asked the students to reflect as they performed the task. For each word they were first presented with the word on a blank sheet of paper and told to indicate whether they knew the word and/or what they knew about it, a second sheet that presented the word in the sentence and asked them if they knew anything more after viewing the word in a contextual sentence, and, lastly, the basic task as above.

Procedure

Students performed the task in one of three conditions:

1. The basic task done independently in a group setting
2. The amplified task done independently as a written introspection in a group setting.
3. The amplified task done in a one-to-one interview setting using a "think aloud" procedure that required them to reflect on the task with the observer as they

completed it.

The directions for the students stressed that observers were interested in knowing what questions and comments occurred to them as they did the task because the goal was improving the task and understanding what questions they had about dictionary use. It was noted, however, that students could not be told the meanings of the words or whether they were correct or not on any part of the task before it was completed. They were allowed to talk to the observers/interviewers but not to one another. Field notes were kept on all observations and interviews and the latter were audiotaped.

After two weeks, the participants took a retention test that asked them to "write what you might say to a friend if you had to explain the word to him/her."

Data Analysis:

Though the primary concern was the analysis of student comments and questions and teacher observations, a performance score was determined to analyze the comparability of the group performances.

Performance Data: Each student's response for each word was scored as correct/incorrect on definition choice, statement of the definition and acceptable/unacceptable for the sentence production tasks. Those students in the amplified task were also recorded as to whether the word was "known/not known" in the isolated word presentation as a check on our original estimation of word familiarity. Performance scores were determined by 3 raters with interrater reliability of 91%. Most of the variance was in scoring the acceptability of produced sentences. All discrepancies were resolved by rescoring.

Analysis of variance on overall performance indicated that overall group performance was comparable (See Table 2), suggesting that the interview group's performance was not unduly affected by interviewers intervention. Also, the "knowness" estimates used to select the words and definitions were accurate (See Table 3).

The retention test was scored 1 for an appropriate definition and 0 for incorrect/no response. For Groups 2 and 3, who had given an initial indication of the words' "knowness," no significant pre-test/ post-test gain was seen (See Table 4).

Observation and interview data: Students in all groups asked questions and volunteered observations, though the bulk of those recorded are from the interviewees. Irrelevant questions (such as , "What time is lunch?") were not included. The procedure followed for the classification and reduction of these data followed a methodology suggested by Goetz and LeCompte (1984); data were analyzed separately by each interviewer/observer and then combined, reduced and discussed in several collaborative data interpretation sessions.

The primary categories of information that emerged were related to observations relating to:

1. The demands of the task
2. The mechanics of dictionary use
3. Interactive and strategic behaviors

(See Table 5).

Discussion

Task Demands

As always, children's interpretations of what a task is and what is called for differed from those of the adults who formulated the task. This seems especially true with fourth graders who have a penchant for the literal (Blachowicz, 1978-79). Changes made in a piloting run of the task failed to produce a totally unambiguous task. The pilot directions for the first part of the task, "Look at the underlined word in the sentence and find the appropriate meaning for this word in the dictionary." were too difficult because the word appropriate was not known or clear. Changing the word to "best," was thought to be consistent with the idea that some of the words had fairly close meanings and to indicate that some evaluation was to take place. It was also consistent with the type of wording used in the current Illinois Goals Assessment Program (Illinois Goals Assessment Program, 1989) which calls for the weighting of alternatives.

Yet students still picked alternatives which were clearly inappropriate for the task sentence. For example, for the sentence "The doctor looked at the x-ray to find the damaged vessel," several students selected the meaning " a large boat; ship." When questioned about the choice and asked whether the meaning fit the sentence, three students responded that the word "best" cued them to the "first" definition. They knew there was something special about the first one and thought that it had to be the "best one." In the group administration, five more students inquired about

"best" as well, asking if it meant "like in the sentence". When students themselves reflected upon the directions they suggested a reformulation as, "Look at the underlined word in the sentence and use the dictionary to find the meaning of the word for the way it's used in the sentence."

A second difficulty arose with the production task directions, "Write an original sentence using the word." Many students did not know the word original, so it was changed to, "Write your own sentence using the word." What was observed then was that many students would choose an appropriate definition but then write a sentence that used the word in a different way. When queried, several of the students indicated that they thought a new usage was called for because the word "own'" suggested a new and novel use of the word. They suggested changing those directions to, "Write a sentence using the word with the same meaning you selected."

A third interesting phenomenon was the production of a sentence when a definition was called for and vice versa. For some of the children, this was a simple placement error; for others, there was a lack of clarity about what was a sentence and what was a definition. This will be commented upon later.

Mechanics of Dictionary Use

All of the children performing the task had some familiarity with dictionary use and/or instruction, as indicated by self-report and teacher report. In line with this, though the interview group contained two children who plodded through each entry letter page-by-page, most of the children were able to locate the target words fairly easily and, in the interview task, the term "guide words" was used frequently and with familiarity. What was interesting were the differing conceptions of how guide words were actually to be used.

In the interview setting, five of the eighteen children noted that they were using the guidewords but a bit differently than they thought they should be. When probed, two children noted that they looked at the guide words but found it easier to look across the middle of the page for a general sense of what was on the page. Three children observed that their own strategies were "easier than using the guide words as they had been taught in school." When they were probed on this as to what they meant, they noted that they felt the instructed strategy was to look at the words on the top of the page and keep your eyes there while

you imagined if your word fell between them. One mentioned using a piece of paper to write down the guide words and your word. Somehow they construed moving their eyes down the page as a less sophisticated practice or as a form of cheating. As our earlier study (Fisher, Kent and Blachowicz, 1990) noted that a significant amount of guide word instruction was done with worksheets and alphabetizing tasks rather than real dictionary use, it seems that this somewhat artificial idea of what the real strategy should be may have developed from this type of practice.

A second observation was that many of the students were not able to easily distinguish among the types of information within an entry. This may have been partly due to unfamiliarity with this particular dictionary but also may have been related to the fact that the dictionary contained three types of information relating to the meaning of words: definitions, examples and usage sentences. Students did not have a clear sense that these were three different aspects of giving information about a word. For some, the entire entry constituted "the definition," so that they did not make a distinction between the definition and the example or context sentence.

Further, what was problematic was not only the variety in these sources of information but the fact that they were represented inconsistently across entries. As with our chosen words, some words had no examples or sample sentences (scaffold), some had definitions and examples (vessel), some had example information and sample sentences but only for the less frequent meanings, and others had all three types of information for all meanings (trough, torrent). Further, the example information was sometimes, but not always, in sentence form, though not italicized. Thus, it was difficult for the students to form any consistent anticipatory set about what each entry would include and to be sure of which part they were consulting. This confusion was confirmed in the interview sessions when students who had written sentences when definitions were called for and vice-versa, reported confusion as to the constituent parts of a definition. Thus, a clearcut schema for the components parts of a dictionary definition as well as consistency in definition composition interacted to make the search task difficult for students.

Another factor noted was that only one student made any reference to the pronunciation of the word. "Trough" was consistently miscued as "through" and "torrent" as "torment," two miscues that will be commented upon later. Further, sheer number of related entries (queen, queenly, Queen Anne's lace, queen sized) caused problems as did the

continuation of a definition on another page. Many students suggested that there be more space between related entries and that a "continuation cue" be placed at the bottom of the page when relevant. This was especially problematic with "vessel" because that was the first meaning was the only one with which they were familiar and they didn't anticipate any further definitions. This observation may be related to the fact that work with the pronunciation key is typically introduced in 5th or 6th grade.

Interactive and Strategic Behaviors

Along with characteristics of the task and their understandings, or misunderstandings, of the design of entries and how to access them, it is clear that the nature of the definitions had a major effect on student choices. What was observed was consistent with the earlier work that suggests that students mobilize such strategies as looking for word matches in the examples, focusing on particular words and fragments in the definition, and over and undergeneralizing when asked to used the dictionary for meaning. Thorndike's general observation that miscomprehension is commonly a product of what he called "overpotency" or "underpotency" of certain items in the material to be read seems to apply to dictionary definition interpretation as well (Thorndike, 1917).

In looking at students' strategic approaches to the task, it is also clear that these general strategies are related to current interpretations of comprehension difficulties as well, most notably those formulated by Goodman and Burke (1970). Some students were quite "schema directed," and their production was driven by their initial conceptualization of the word's meaning. This was apparent in "vessel" where the ship related meaning was a meaning known before the task was undertaken. There was a by-pass of the "fit in the context sentence" aspect of the directions and so that the meaning chosen and sentence produced related to boats.

Though the meanings for "vessel" were normally reformulated when the interviewee examined the sentence and the other definitions a second time, "torment" for "torrent" was not untangled so easily. In the definition, "violent" was focused on in "violent rushing storm," and seen as confirming "torment," since both were "angry" types of words. One student noted that "a heavy downpour" would cause torment, as in "the flooding of the house caused the family a lot of torment.".

As well as directing students to focus on particular words in the entry, prior knowledge shaped the actual reading of the entries. For trough a common miscue was through ,and

We led our horse to the watering trough

became,

We led our horse through to the water.

And,

"a channel for carrying water"

became,

"a channel for carrying water through."

As was noted earlier, the pronunciation was not consulted by 17 of the 18 interviewees, so the possibility of that information modifying their initial choice was lost. Thus, it was clear to the observers that many students are driven by their initial schema for the word and that shapes their both what they select to focus on and how they read the entries. Since so many other aspects of the definitions were difficult, they depended on that first formulation and worked to make the language of the sentences and definitions match these early conceptions.

If this schema directedness is an example of "what they do know hurting them," it was also clear that lack of knowledge about concepts made other tasks difficult. A good example of this process was in the completion of the task for "queen." The first definition for this word is "queen as wife of the king," the second was "queen as ruler." Several of the interviewed students noted that these should be one definition as they were the same. They did not know that the consort queen was not a ruler nor that the ruling male is a king while the consort male is a prince. The fact that the term "queen" could refer both to a ruling and non-ruling woman was not known to them so that they could not discriminate between the two definitions. In more specific ways, the terms used in the definition were difficult also. Defining a "trough" as "a long hollow between two ridges" caused much difficulty as a hollow was seen as a tubelike thing and a ridge was a bump. One student offered that a trough was something like a baton; another suggested a keyhole; a third offered a chin-up bar.

In discussing the relationship to the students' initial knowledge, many of the observers noted an "aha" (more commonly with children, an "o yea") reaction with respect to

the words "vessel" and "scaffold." Six of the students volunteered that they had seen scaffolds at one time or other and two noted that they had thought that might be called an easel but now knew it was different. For "vessel," three students noted that the blood carrying tube was another meaning of the word they knew, though they hadn't remembered it earlier. No recognition reactions were noted with what were deemed the two hardest words, "torrent" and "trough."

Besides the observation that both knowledge and lack of knowledge affected student miscues, it was also observed that students have "styles" with which they approach dictionary use. With eleven of the interviewed children, three consistent patterns were observed. Five searched for a meaning that seemed to fit the target sentence and stopped as soon as their criteria were met without looking past the definition they chose. Three read through each and all definitions and then went back and chose the one they though was best. They perceived the task as an evaluative one. Three perceived the task as an abstracting one. They too read all of the definitions but proceeded to formulate their own definitions which were more encompassing of all the definitions; they looked for something in common among the definitions.

For example, for torrent, they said that what all the definitions had in common was a "bunch of stuff" and this bunch of stuff rushing or falling down. For "scaffold," they noted, rightly, that all of the scaffolds were raised platforms so that all the definitions were quite similar. Thus they said it didn't matter really which was chosen; they perceived the task as generative as well as interpretive and all three chose to write their own definitions.

It seemed, therefore, that students were not random in their approaches to the task. Their initial schema about a word's meaning could be quite powerful in governing their selection of focus information. It could also shape the way in which they read that information. Lastly, many of the interviewees gave indication that they applied a recognizable search strategy to the task at hand.

Implications for Instruction and Further Investigation

The teacher-researchers who carried out this investigation came away with two insights for instruction and several directions for further classroom research. The first was the recognition that dictionaries could be much more

"user-friendly" for middle school students. Several of the teachers went back to their classes to discuss the less familiar words and attempted to reformulate definitions that would be more revealing of each word's meaning. The students had some basic suggestions for dictionary designers that were interesting and relevant to the task.

The first was the suggestion that, when appropriate, definitions start with a general statement about the word and then give specific examples, rather than differently numbered definitions. For example, they rewrote scaffold as

> In general: any raised platform used to hold people or equipment
>
> For example:
> -painters use scaffolds to hold their equipment when working in high places
> -executioners use scaffolds when they hang someone
> -window washers use scaffolds when they wash high up

For queen, they suggested

> In general: a woman in the ruling family
> For example: a queen can be the ruler's wife
> a queen can be the ruler herself
> a queen can be a real special female to a particular group (Your mom is the queen of your family.; The most important female bee is a queen bee.)

Another suggestion was to tell what is most important about the characteristics of the word being defined. For <u>scaffold</u> it was that it was a platform and that is was raised. For <u>queen</u>, that it was a female and connected to the ruling family. Their suggestion for torrent was:

> In general: a torrent is a <u>lot</u> of something that can <u>rush down</u> on you
> For example: a rushing stream of water is a called a torrent
> -a lot of noise that comes at you can be called a torrent (There was a torrent of cheers at the game when we scored.)

Lastly, the students suggested that illustrations be used for harder words. "Trough," with its enigmatic second definition, "something shaped like this..." which referred

to an animal trough, or a long hollow between two waves, called out for a picture with a diagram that suggested that trough-shaped thing was definable as a "trough." They noted that the space for pictures on that page was used for a map of Asia Minor that was less called for and less useful that a diagram of trough at that point. The construction and testing of such definitions would be an interesting subject for further instructional research.

Besides realizing that dictionaries were imperfect tools, especially for middle graders, a second insight that was most dramatic for the teachers concerned the relative ineffectiveness of the dictionary task. Several of the teachers noted that they were aware that their less able students gained very little from dictionary use but they had thought that more able students were able to take better advantage of the information a dictionary had to offer. They were amazed at the overall lack of gain in student knowledge, especially for the words for which they felt the students had an already established concept which merely needed a label (scaffold, vessel) and which seemed to have provided an insight to some of the students in the task sessions.

For most of the teachers, this led to a resolution to reconsider the use of this task in the classroom. Rather than abandon the use of the dictionary, they felt that educators should experiment with different types of instruction. Since the observations indicated that students exhibited a lack of clarity about what the entries contained and tended to hold to their initial schema for a word's meaning, the teachers reasoned that a schema focused instructional approach was suggested. Students need to be aware of what types of clues to a word's meaning are given by a reference and need to develop a strategy for extracting information relevant to a larger context containing that word. Just as predictive instructional models, such as the Directed Reading-Thinking Activity, have proved beneficial in prose, perhaps they could be modified to apply to the dictionary use process.

Along with the possibility of researching new instructional approaches, some of the researchers were dissatisfied with the design of the inquiry and felt more learning may have taken place. They noted that, though a characteristic curricular task was used, this task is normally followed in the classroom by seeing these words in print as a selection was read and using the words in a discussion context. Further, it was suggested that an appropriate assessment task would have been a recognition type matching task rather than a meaning generated one, so that future research as to

whether knowledge about words may be gained from a dictionary should focus on a more normal exposure to the words and a different assessment device. These teacher-researchers are also examining the types of incorrect responses about the words produced in the post-test to see if some new, and correct, semantic associations were made as a result of the students' brief use of the dictionary.

A last line that seems worthy of pursuit is the issue of the differing "styles" emerged in the interviews. These may have been artifacts of the "think-aloud" process but the teacher-researchers felt that they would like to gather more data on students with identifiable styles and see if these styles implied more or less success with different dictionary tasks.

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Table 1.

Difficulty levels, familiarity ratings for grade levels, and definition position of task words

	Level	Familiarity rating *		Def. #
		Grade	Rating	
queen	1	4th	70%+	2
house	1	4th	70%+	1
trough	2	6th	67%	4
vessel	2	6th	82%	3
torrent	3	10th	73%	3
scaffold	3	10th	72%	1

* From The Living Word Vocabulary

Table 2.

Analysis of variance, means and standard deviations of performance scores for the three task groups

Anova

Source	SS	DF	Variance est.
Among	30.15	2	15.08
Within	727.23	52	13.99
Total	757.38	54	

F-Ratio	1.08
Significance	0.3486

Group	N	Mean	SD
1	17	11.41	4.72
2	20	12.00	3.13
3	18	13.22	3.30

Table 3

Actual familiarity of task words to students in task groups 2 and 3

Word	Students who knew word prior to task
queen	32
house	37
vessel	13
trough	0
torrent	3
scaffold	2

Table 4

Pretest and posttest scores for word knowledge on four task words

	Pretest	Posttest
Group 2		
vessel	6	3
trough	0	0
torrent	3	4
scaffold	2	2
Group 3		
vessel	7	7
trough	0	0
torrent	0	1
scaffold	0	0

Table 5

Number of observations coded in each category

	For Group		
	1	2	3
Category			
Demands of task	7	32	45
Mechanics	2	26	179
Interaction/ Strategies	50	86	734
Other	17	10	24
Totals	136	154	982 136 154 1272

Appendix

house (hous *for 1-4,6-8;* houz *for 5*). 1 building in which people live. 2 people living in a house; household. 3 family with its ancestors and descendants, especially a noble family: *He was a prince of the house of David.* 4 building for any purpose: *an engine house.* 5 take or put into a house; provide with a house; shelter: *Where can we house all these children?* 6 place of business or a business firm: *a publishing house.* 7 assembly for making laws and considering questions of government; lawmaking body. In the United States, the House of Representatives is the lower house of Congress; the Senate is the upper house. 8 audience: *The singer sang to a large house.* 1-4, 6-8 *n.*, *pl.* **hous es** (hou′ziz); 5 *v.*, **housed, hous ing.**

queen (kwēn). 1 wife of a king. 2 woman who rules a country and its people. 3 woman who is very important, stately, or beautiful: *the queen of society.* 4 a fully developed female in a colony of bees, ants, etc., that lays eggs. There is usually only one queen in a hive of bees. 5 a playing card bearing a picture of a queen. 6 the most powerful piece in chess. It can move in any straight or diagonal row. *n.* [*Queen* comes from Old English *cwēn*]

scaf fold (skaf′əld). 1 a temporary structure for holding workers and materials. 2 a raised platform on which criminals are put to death. 3 any raised framework. *n.*
scaf fold ing (skaf′əl ding). 1 scaffold. 2 materials for scaffolds. *n.*

tor rent (tôr′ənt). 1 a violent, rushing stream of water: *The mountain torrent dashed over the rock.* 2 a heavy downpour: *The rain came down in torrents during the thunderstorm.* 3 any violent, rushing stream; flood: *a torrent of questions, a torrent of lava.* *n.*

trough (trôf). 1 a long, narrow container for holding food or water: *We led our horses to the watering trough.* 2 something shaped like this: *The baker used a trough for kneading dough.* 3 channel for carrying water; gutter: *The wooden trough under the eaves of the house carries off rain water.* 4 a long hollow between two ridges, etc.: *the trough between two waves.* *n.* —**trough′like′**, *adj.*

ves sel (ves′əl). 1 a large boat; ship: *Ocean liners and other vessels are usually docked by tugboats.* 2 a hollow holder or container. Cups, bowls, pitchers, bottles, barrels, and tubs are vessels. 3 tube carrying blood or other fluid. Veins and arteries are blood vessels. *n.*

From: Scott Foresman Intermediate Dictionary. Glenview: Scott Foresman and Co. 1983.

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